



IEEE CINCINNATI SECTION NEWSLETTER – MAR. 2010

MARCH MEETING

Carbon Capture and Sequestration (CCS), a Duke Energy Perspective on CO₂

DATE: Thursday, March 25, 2010
PLACE : Raffel's – 10160 Reading Road (see below for directions)
TIME : 5:30 p.m. to 6:00 p.m. - Social Time
6:00 p.m. to 7:00 p.m. - Dinner
7:00 p.m. to 8:30 p.m. - Presentation
COST FOR DINNER: \$10.00 per person – Regardless of Membership or Membership Grade!

NOTE: DINNERS ARE ALWAYS OPTIONAL - YOU MAY ATTEND THE PROGRAM ONLY.

MENU SELECTIONS: Stuffed Pasta Shells, BBQ'd Ribs, Marinated Char Grilled Chicken Breast, Au Gratin Potatoes, Buttered Corn, Cole Slaw, Tossed Salad, Dinner Rolls and Butter, Coffee, Tea, Iced Tea, Soft Drinks. There is also a bar available for the purchase of alcoholic drinks.

LOCATION: Raffel's is located at 10160 Reading Road, south of Glendale-Milford Road on the east side of Reading. Take I-75 to the Glendale-Milford Rd. Exit, go east on Glendale-Milford Road approximately ¾ of a mile to Reading Rd. and turn right on Reading.

RESERVATIONS: Please email Fred Nadeau for reservations at Reservations@ieeeCincinnati.org (preferred) or call the Section Voice Mail at 513-629-9380 by **Noon, Tuesday, March 23, 2010** if you plan to attend. Please leave your Name, IEEE Member Number, and a daytime telephone number.

PE CREDITS: Depending on the subject matter, attendance at IEEE Cincinnati Section Meetings now qualifies the attendee for Professional Development Hours towards renewal of Professional Engineers Licenses. Required documentation will be available following the meeting! The Section Meetings also provide a great opportunity to network with fellow engineers in the area.

ABOUT THE MEETING: Carbon Capture and Sequestration (CCS) provides a means to dramatically reduce the amount of carbon dioxide (CO₂) emitted into the atmosphere from industrial facilities or when electricity is generated by fossil fuel power plants. Although carbon dioxide is neither toxic nor inherently dangerous, the overabundance of atmospheric CO₂ is believed to be a major contributor to global climate change.

Up until now, the release of carbon dioxide into the atmosphere has been inevitable when power is generated from fossil fuels such as coal, oil and natural gas. Now, however, new power plants are being designed with processes to separate carbon dioxide so that it is not released into the atmosphere. Instead, the CO₂ is captured and can be piped to underground geological formations where it can be permanently sequestered.

ABOUT THE SPEAKER: John G. Bloemer of Duke Energy has over twenty-nine years in the Power Generation Industry, holding various positions in Engineering, Staff, and Management roles. Positions held in the General Engineering, Resource Planning, Power Services, Business Development Support, and Analytical Engineering departments, with areas of responsibility covering System Protection, Integrated Resource Planning, Emissions Compliance Planning (both Phase I & Phase II CAAA and CAIR/CAMR), Rate Case, Fuel Clause & CPCN Support, and Generation Project Development and Siting technical support functions. John is a Registered Professional Engineer in the Commonwealth of Kentucky.

Mr. Bloemer obtained an Associate of Applied Science in Electronics Technology and Bachelor of Science in Mathematics from Northern Kentucky University, and a Master of Science, Electrical Engineering, MS(EE) from the University of Cincinnati. He has also attended and presented at many industry related seminars and forums throughout career.

MEMBERSHIP NEWS

NEW MEMBERS

The following individuals are IEEE members who are new to our Section:

Annie M. Avakian	Vasile Nistor
Devin Christopher Cole	David Pruss
Justin Andrew Daniels	Michael Valentine
William Francis Harkins III	Philip Shaun Wheeler
Daniel Holder	Bryon Wilkins
Catherine A. Huitger	Jia Yang
Milo Wilt Hyde	

We wish to welcome these new members to the Cincinnati Section!!!

Scanning the Past: A History of Electrical Engineering from the Past

Submitted by Bob Morrison, Editor

Copyright 1996 IEEE. Reprinted with permission from the IEEE publication, "Scanning the Past" which covers a reprint of an article appearing in the Proceedings of the IEEE Vol. 84, No. 8, August 1996.

Semi J. Begun and Magnetic Recording

Fifty-five years ago this month, the PROCEEDINGS OF THE INSTITUTE OF RADIO ENGINEERS (IRE) included a paper by Semi J. Begun on magnetic recording and applications for radio broadcasting. At the time, the author was employed as a research engineer at the Brush Development Company in Cleveland, OH, where he worked from 1938 to 1971. He made numerous contributions to the technology of magnetic recording and was elected a Fellow of the IRE in 1952.

Begun was born in Danzig, Germany, in 1905. He received the Master's degree from the Institute of Technology in Berlin in 1929. He earned a doctorate from the same institution in 1933. In 1929 he joined the firm Schuchardt AG in Berlin, where he did developmental work on a steel magnetic recorder known as the Dailygraph, which is shown in Fig. 1. This machine featured a cartridge with two wire wheels and could be used in offices for taking dictation or to record telephone messages. In 1932, the International Telephone and Telegraph Company acquired Schuchardt AG and transferred magnetic recording research and development activities to Lorenz Ag, a subsidiary in Berlin. Begun directed a small group at Lorenz which began work on a steel tape recorder as an alternative to steel wire. The steel tape recorder developed by Begun and his group is

shown in Fig. 2. However, the rise to power of Hitler and the National Socialists in Germany caused Begun to emigrate to the United States in 1935.

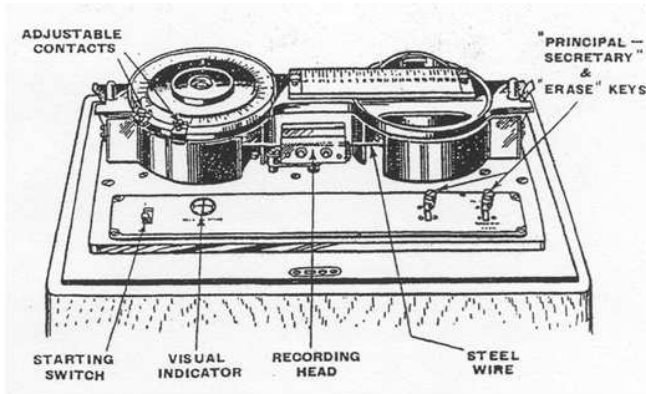


Fig. 1. The Dailygraph Wire Recorder was sold in Germany in the 1930's and was intended for use as a dictation machine.

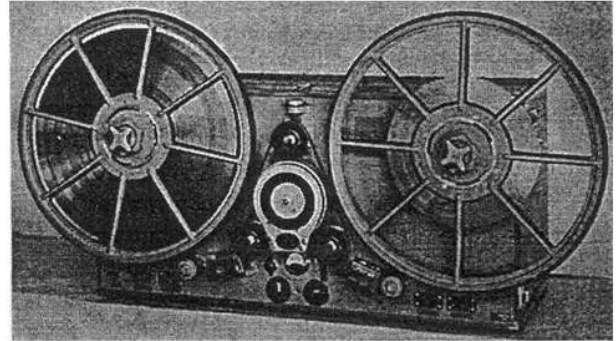


Fig. 2. This steel tape recorder was designed by Begun while Working for the C. Lorenz Company in Berlin, just prior to World War II

Soon after his arrival in the United States, Begun and two associates organized the Magneton Company to manage his magnetic recording patents. Subsequently, the Brush Development Company negotiated a license agreement with Magneton and Begun was hired to lead a group at Brush devoted to the development of magnetic recorders. They worked on various types of wire, disk, and tape recorders although none achieved commercial success prior to the war. Fig. 3 illustrates an example of a steel tape endless loop recorder developed during 1939-1941.

In his August 1941 PROCEEDINGS paper, Begun reported that magnetic recording was already in use in Europe in the radio broadcasting field but not yet in the United States. He pointed out that magnetic recording permitted a time delay and was useful when repetition was necessary. During World War II, Begun contributed to the design of magnetic recorders for military applications including wire recorders for use in aircraft. He also did preliminary work on the use of paper or plastic tape coated with magnetic materials. This work was done with the assistance of the Minnesota Mining and Manufacturing Company (3M).

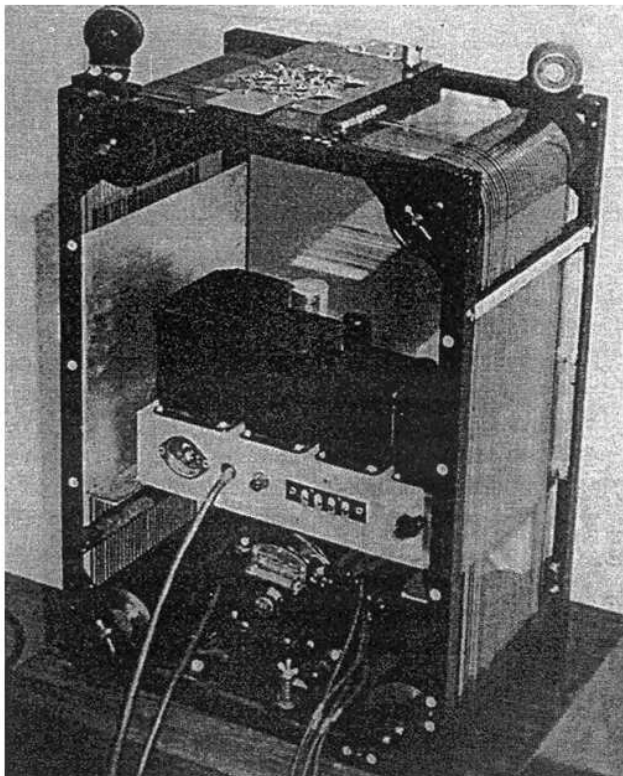


Fig. 3. This is an example of a steel tape endless loop recorder developed by Begun. The prototype was developed in 1937 and production was begun by the Brush Company in early 1939, used for repetitive replay operation.

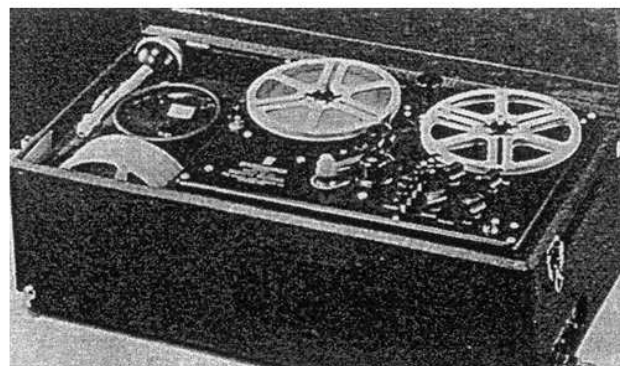


Fig. 4. This is the "Soundmirror" papertape recorder developed by Begun at the Brush Company in 1946.

After the war in 1946, the Brush Company began marketing the so-called "Soundmirror" which employed a paper tape with magnetic oxide coating. This model is shown in Fig. 4. Begun also worked on television and computer applications of magnetic recording before retiring from Brush in 1971.

After leaving Brush, he founded and served as President of Auctor Associates, a consulting firm in Cleveland. He participated in a study of the causes of violence carried out by The Society for Prevention of Violence and served as the President of the Society during 1989. He became a strong advocate of reforms in elementary education and urged the IEEE-USA to take a more active role in changing "an education system that has not responded with vigor to changing social conditions." Begun died in 1995 at the age of 89.

*James E. Brittain
School of History , Technology and Society
Georgia Institute of Technology*

IEEE NEWS

New IEEE-USA President Identifies Advancing Viability and Contributions of the Profession as Top Priority for 2010

WASHINGTON (5 February 2010) -- Evelyn H. Hirt, who became IEEE-USA president on 1 January, has identified advancing the viability and contributions of the profession as her top priority in 2010. Her concerns encompass the need for recognition of the significant role played by engineers in powering the U.S. economy, and for science, engineering and technical literacy to fuel the creation of future engineers and technical professionals.

"Engineers create jobs by providing systems, products and services through the application of mathematical and scientific principles to practical ends," Hirt said. "It is this practical application that helps fuel the economy by furthering industrial and commercial objectives in advancing the design, construction and operation of economical and efficient structures, equipment and systems."

Hirt, who lives in Richland, Wash., succeeds Dr. Gordon Day of Boulder, Colo. Day is serving as IEEE-USA's past president in 2010 and Ron Jensen of Rochester, Minn., is the organization's president-elect.

Hirt sees a technically literate workforce, particularly among the young, as being essential to advancing U.S. competitiveness in the 21st century.

"If young people lack recognition of the significant role played by engineers and technical professionals, and without an attractive job market, they will not be motivated to pursue engineering and technical careers," she said. "Similarly, existing engineers and high-tech professionals will be drawn away from their current careers voluntarily or involuntarily. This will be compounded if individuals lack the science, engineering and technical literacy to obtain the required advanced education or deal with changes in technology trends to meet current demands, should their career motivation change.

"However, we need to think beyond the concept that science, engineering and technical literacy is only for those going on for advanced education or planning a technically demanding career. This literacy is an essential part of powering productive sectors of a global economy and strengthening U.S. competitiveness."

IEEE-USA has identified a number of public policy priorities that have job-creating potential and carry the promise of making technical careers more appealing: Universal availability of high-speed broadband, patent reform, electronic health records, cybersecurity and more research into alternative energy resources. <http://www.ieeeusa.org/policy/issues/index.html>

IEEE-USA is also supporting efforts to build the nation's Smart Grid, which has the potential to create jobs similar to the way the Internet did. Smart Grid R&D aims to modernize the electric grid through multi-disciplinary advances in generation, transmission, distribution, storage and control over energy use. Jobs are projected to be created in manufacturing, installation, equipment operation, telecommunications networks, software and controls. Expectations are that homeowners and businesses will be provided the opportunity for greater control over their energy use. <http://smartgrid.ieee.org/>

Engineering job creation is particularly important in light of recent statistics from the Department of Labor's Bureau of Labor Statistics. Job losses across all engineering disciplines, according to the agency, totaled 76,000 in 2009 vs. the previous year. Among electrical and electronics engineers, employment fell by 36,000.

The number of working computer professionals dropped 198,000 in 2009 vs. 2008. These figures include software engineers, whose job losses totaled 82,000 year over year; and computer scientists and systems analysts, who saw 78,000 jobs disappear.

"Putting engineers and computer professionals back to work will help power the U.S. economy," Hirt said. "They will foster technological breakthroughs and engineering solutions to meet the great challenges facing our country and help create opportunities throughout the workforce."

[Meet the New IEEE-USA President](#)

Hirt, who has worked in engineering for more than 37 years, is a principal professional and engineer with Battelle in the Operational Systems Directorate at the Pacific Northwest National Laboratory in Richland, Wash. Her professional experiences bridge the industrial, government and academic communities as both a technical contributor and technical/project manager. She is a subject matter expert in systems (hardware, software and integration) and controls, as well as quality engineering.

Hirt received IEEE-USA's highest honor last year, the Robert S. Walleigh Distinguished Contributions to Engineering Professionalism Award, "for enthusiastic leadership and contributions in a wide range of IEEE-USA professional activities." In 2008 she was presented the IEEE Nanotechnology Council Distinguished Service Award.

As an active IEEE volunteer for more than 35 years, Hirt has held a wide variety of local, regional, technical, national and global leadership positions. She served on the IEEE-USA Board of Directors as Region 6 director in 2003-04 and was on the IEEE Initiative Committee on Nanotechnology for a Wider Audience (www.TryNano.org) in 2008-09. She was founding chair of the IEEE Richland Section Sensors Council Chapter in 2007-08, and was a member of the IEEE Aerospace and Electronic Systems Society Board of Governors from 2003 to 2007.

In addition to her IEEE activities, Hirt actively participates in Eta Kappa Nu and Kiwanis International, and supports the engineering program at Washington State University Tri-Cities.

Born and raised in Detroit, Hirt graduated cum laude with a bachelor of electrical engineering from the University of Detroit. She added a master's in engineering management and a certificate in project management from Washington State University.

IEEE-USA AWARDS \$8,000 TO UNDERGRADUATES, JOURNALISTS WHO ADD TO PUBLIC UNDERSTANDING OF ENGINEERING

WASHINGTON (12 February 2010) -- Coinciding with Engineers Week from 14-20 February, IEEE-USA is announcing \$8,000 in scholarship awards and honoraria to be presented to five U.S. undergraduate students and to two professional journalists who add to the public understanding of engineering.

IEEE-USA ONLINE VIDEO COMPETITION: According to Nita Patel, IEEE-USA vice president of communications and public awareness, \$5,000 in scholarship awards will be given to five undergraduates at three U.S. universities, who entered the organization's 2010 "How Engineers Make a World of Difference" online video competition: First Prize (\$2,000) to Sergio Flores Castro, Miguel Murillo and Carolina Flores of UNLV; Second Prize (\$1,500) to Zachary Phillips of LeTourneau University in Long View, Texas; and Third Prize (\$1,000) to Carrie Hunter of Pensacola (Fla.) Junior College.

The three video entries were deemed most effective in reinforcing for an 11-to-13-year-old audience how engineers improve quality of life. Entries in the third annual IEEE-USA video competition profiled an engineer or technologies.

Pensacola Junior College's Hunter will also receive a \$500 scholarship award for the most innovative and effective presentation of a video entry to the "tween" target audience. A representative of the first-prize team from UNLV will be recognized at the IEEE-USA Annual Meeting in Nashville, Tenn., on 6 March.

The award-winning entries will also be featured in the first nationwide Web-based gathering of engineering students, an "Engineers Week Blast!" live from Howard University in Washington, D.C., on 18 Feb. from 8-9 p.m. ET, at <http://www.ibroadcasts.tv/asce-live-webcast.html>

The three-judge video competition panel included: Andrew Quecan, a Ph.D. student in electrical engineering at Stanford University; Suzette Aguilar, a Ph.D. student at the University of Wisconsin; and Nate Ball, mechanical engineer and host of PBS' "Design Squad."

According to IEEE-USA's Patel, the video competition was designed to be replicated in IEEE student sections both in and outside of the United States. IEEE-USA will launch its fourth video scholarship competition in September.

To view all of this year's award entries, go to <http://www.youtube.com/ieeeusavideo>.

IEEE-USA JOURNALISM AWARD: Additionally during Engineers Week, according to IEEE-USA Communications/Public Awareness Vice President Patel, the organization is presenting two \$1,500 honoraria to recognize print and electronic journalists who have added to a greater public understanding of the contributions of engineering and computer professionals to society. The two recipients of the IEEE-USA journalism award are: Holly Morris from Fox 5 Morning News in Washington; and Randy Atkins from the National Academy of Engineering (NAE), also in Washington.

Fox 5's Morris, who has a degree in civil and environmental engineering, was singled out for her coverage of the 2009 National Engineers Week Future City Competition. Atkins, NAE's senior program officer for media/public relations, was tapped for providing one-minute weekly radio features highlighting engineering innovations and stories that add technical context to issues in the news. Both will be recognized with the IEEE-USA Award for Literary Contributions Furthering Public Understanding of the Profession, at the organization's annual meeting in Tennessee's capital city.

Pittsburgh Biomedical Engineering Researcher, Entrepreneur Chosen as an Engineers Week New Face of Engineering

WASHINGTON (19 February 2010) -- Biomedical engineer Sanna Gaspard is researching ways to improve the survival rate of premature babies. For this and other work she was chosen as a 2010 Engineers Week "New Face of Engineering."

Gaspard, a Ph.D. candidate at Carnegie Mellon University in Pittsburgh, is founder and CEO of TLneoCare, LLC, a start-up company focusing on developing and commercializing a neonatal message unit to aid infants born prematurely. The company is in the process of raising capital for prototyping, FDA classification and clinical testing. Her doctoral research is focused on designing a diagnostic tool for stage 1 pressure ulcers.

Alessandro Ferrero, past president of the IEEE Instrumentation & Measurement Society, worked with Gaspard at his "Politecnico di Milano" lab in Italy.

"Ms. Gaspard is a truly dedicated biomedical engineer with an entrepreneurial spirit committed to translating her bioinstrumentation research and development to society, where it has the potential to save lives," Ferrero wrote in his nomination letter.

The New Faces of Engineering recognition program is sponsored by the National Engineers Week Foundation, a coalition of engineering societies, major corporations and government agencies. The program highlights the vitality, diversity and rich contributions of engineers under 30. They are honored annually during Engineers Week.

Gaspard was one of 13 engineers recognized for this international honor and featured in a full-page ad that ran in USA Today on 16 February: http://www.eweek.org/Site/pdfs/USA_Today_Ad.pdf.

Gaspard is the GOLD (Graduate of the Last Decade) representative to the IEEE Instrumentation & Measurement Society. She is also a member of IEEE's Engineering in Medicine and Biology Society, and founded the Graduate Biomedical Engineering Society at Carnegie Mellon.

Dr. Robert J. Webster III, an assistant professor at Vanderbilt University, and Ryan Acierno, an engineer with CH2M HILL, were IEEE-USA's two other finalists. <http://www.eweek.org/site/Engineers/newfaces2010/IEEE.shtml>.

Florida, Nevada Middle Schools Honored by IEEE-USA at Future City Competition National Finals
WASHINGTON (26 February 2010) -- Martinez Middle School of Lutz, Fla., was presented the 10th-annual IEEE-USA Best Communications System Award at the National Engineers Week Future City Competition National Finals last week. Northern Nevada Home Schools Mt. Rose captured third place honors -- also sponsored by IEEE-USA -- in the overall competition.

Martinez Middle School was recognized for the most "efficient and accurate communications system" at the Hyatt Regency Washington on Capitol Hill. Its city, "Factitious Insula," is set in 2209 and features a communications system based on teleportation.

Combining properties of telecommunications and transportation, this near instantaneous transfer of matter from one place to another would allow a resident of Factitious Insula to speak with anyone in person. (You couldn't just pop into someone's place unannounced; you would have to have permission.)

The Martinez team included students Kiran Shila, 14, eighth grade; Erik Tanberg, 13, eighth grade; and Michael Palermo, 13, seventh grade; science teacher Kathleen Baten; and engineer-mentor Jennifer Bartlett. (Student team member Mitchell Bowers, 12, seventh grade, was killed while riding his bicycle shortly after the team won the Florida (Tampa) regional competition last month.)

Baten also teaches the Future City elective class the school offers in the fall. It had seven teams compete this year, each with 3-4 members. The top two teams qualified to represent Martinez at the regional contest.

IEEE-USA President Evelyn Hirt presented Martinez team members with plaques. Each student will also receive a \$100 U.S. Savings Bond.

By placing third in the overall competition with its 2030 city "Esperanza," Northern Nevada Home Schools Mt. Rose won \$2,000 for its science and technology program. The team was comprised of students Jamie Poston, Bailey Watkins and Juliana Lucas; engineer-mentor Jamie Lee Poston; and teacher Patricia Eileen Poston.

Davidson (N.C.) International Baccalaureate Middle School won the grand prize for its future city, "Mamohatra." The five team members will receive a trip to U.S. Space Camp in Huntsville, Ala., courtesy of Bentley Systems, Inc.

They and teams from Florida (Miami), Michigan and Nebraska joined President Barack Obama in the White House and asked questions of astronauts aboard the International Space Station. See video at <http://www.whitehouse.gov/blog/2010/02/17/president-obama-calls-space>.

About Future City

The Future City Competition (www.futurecity.org), initiated by IEEE-USA in 1993, is designed to promote technological literacy and engineering to middle school students. Under the guidance of an engineer and teacher, the children create their own vision of a future city, working first on computer and then constructing three-dimensional scale models.

The students also have to write an essay about a predetermined challenge the city might face. This year's theme was to design "an affordable living space for people who have lost their home due to a disaster or financial emergency." The final piece of the contest is a presentation before a panel of judges.

More than 1,100 schools and 33,000 students from across the United States competed during the 2009-10 season. Thirty-nine regional champions earned a trip to Washington for the National Finals. Pilot programs are held in Egypt, Sweden and Japan. A spinoff, "Future Cities 2020," is underway in India.

When the first Future City Competition was staged, about 600 students and 175 schools participated across five regions. For more on the early history of the program, go to <http://www.todaysengineer.org/2008/Feb/FCC.asp>.

IEEE-USA President Praises U.S. Job Growth Initiative by Invest in America Alliance

WASHINGTON (26 February 2010) -- IEEE-USA President Evelyn Hirt praises the Intel-led Invest in America Alliance for its \$3.5 billion initiative to support investment in U.S.-based technology companies over the next two years, and for its commitment to significantly increase jobs for college graduates.

"We commend the Invest in America Alliance for its investment in U.S. businesses and for creating high-skill job opportunities for U.S. workers," Hirt said. "Overall, this will benefit the U.S. economy as we recover from the recession, and it is anticipated that additional near- and long-term job opportunities will result. This pledge for hiring college graduates and the prospect of future job opportunities will assist in encouraging young people to continue to seek education in science and engineering."

Intel President and CEO Paul Otellini announced the initiatives Tuesday in a speech at the Brookings Institution in Washington. http://www.intel.com/pressroom/kits/investinamerica/Brookings_PaulOtellini_022310.pdf

"Strong, enduring economies grow out of a culture of investment and a commitment to innovation," Otellini said. "We simply must have a clear, consistent strategy to promote innovation, investment and start-up companies. There are things business can do, and ought to do, independent of what government achieves."

"It would be a long-term mistake to let our future scientists and engineers sit idle after graduation. [These] announcements are both an investment in the country's innovators and a signal to the global marketplace about America's commitment to innovation and future competitiveness."

The \$3.5 billion alliance investment include a new \$200 million "Intel Capital Invest in America Technology Fund" that will target key innovation and growth segments such as clean technology, information technology and biotechnology.

Otellini's announcement also included a pledge from 17 technology and other corporate leaders to increase their hiring goals for college graduates over 2009 levels, some as much as twofold. This represents 10,500 jobs, largely for those with engineering and computer science backgrounds.

Companies joining Intel in this pledge are Accenture, Adobe Systems Incorporated, Autodesk, Broadcom Corporation, CDW LLC., Cisco, Dell, eBay, Inc., EMC Corporation, GE, Google, Inc., HP, Liberty Mutual Group, Marvell Semiconductor Inc., Microsoft Corporation and Yahoo!

"I believe that together our commitments to seeding the ground with start-up capital will prove to be a very rewarding investment for both the companies that contribute, and for the competitiveness of the United States," Otellini said. "And, since venture-backed companies in the U.S. accounted for more than 12 million jobs, or 11 percent of total private sector employment in 2008, these investments will also help drive job growth in the U.S. now and in the future."

For more of Hirt's perspective on the announcement, go to <http://www.eetimes.com/news/latest/showArticle.jhtml?articleID=223100356>

IEEE-USA to Host Rescheduled Roundtable Discussion on Potential of Standardizing Patent Dictionaries
WASHINGTON (1 March 2010) -- IEEE-USA will host a roundtable discussion to explore the potential ramifications of adopting standardized definitions for use in the patent application process.

The discussion, "Patent Applications & Commonly Used Terms: Can Standardized Dictionaries Enhance Patent Quality and Speed the Review Process?" is set for Friday, 19 March in IEEE-USA's conference room.

The event was postponed on 5 February because of a snowstorm in Washington.

Hosted by the IEEE-USA Intellectual Property Committee (IPC), attendees will include, among others, representatives from the U.S. Small Business Administration, the IEEE Standards Association, the Business Software Alliance and the U.S. Patent and Trademark Office (USPTO).

The use of commonly understood, standardized terminology when applying for a patent plays a key role in whether a patent is approved or not. Carefully choosing terms you hope will effectively and unmistakably describe an invention can be a challenge to even the most seasoned patent attorneys and inventors. For USPTO reviewers, correctly interpreting the intended meaning of the words which applicants use can mean the difference between unequivocal claims and expensive litigation to resolve disputes.

"Precision of patent terminology, as understood by applicants, the U.S. Patent Office and our courts, has the potential to impact higher levels of certainty about what a patent holder owns," IEEE-USA IPC Chair Keith Grzelak said. "We hope our discussion yields the positive and negative implications of having a standardized dictionary."

For more information, contact Erica Wissolik, IEEE-USA program manager, government activities, at e.wissolik@ieee.org or 202-530-8347.